

WHAT IS CLAIMED IS:

1. A storage subsystem comprising:

plural storage units; and

a storage control unit that is connected to a central processing unit and has an internal cache memory for temporarily storing data exchanged between said central processing unit and said storage units,

wherein said storage subsystem is connected to said central processing unit by an I/O interface protocol by which said central processing unit issues I/O requests including a chain of plural commands and data to said storage control unit asynchronously with responses from said storage control unit,

wherein said storage control unit has means that decides an order of processing said plural commands and data from said central processing unit independently of the order they were received, and executes said commands, and

wherein said plural storage units are under control of said storage control unit.

2. The storage subsystem according to claim 1, wherein said storage control unit has a means that, of plural commands received from said central processing unit, for said commands having processing target data existing on said cache memory, performs data transfer with said central processing unit, and if processing target data of said commands does not exist on said cache memory, reads said processing target data from said storage units into said cache memory in parallel with data transfer with said central processing unit.

3. The storage subsystem according to claim 1, wherein said storage control unit has means that, in the case where a RAID configuration is taken to distribute data of one logical volume across said plural storage units, merges plural commands received from said central processing unit into one command group; when processing target data of plural commands of said command group does not exist on said cache memory, in parallel activates more than once reading of processing target data of commands of said command group into said cache memory from the individual storage units in which said processing target data of said commands is stored, and in order of completion of said reading, for said commands of said command group, performs data transfer with said central processing unit in parallel with said reading.

4. A storage subsystem comprising:

plural storage units; and

a storage control unit that is coupled to a central processing unit and has an internal cache memory which temporarily stores data to be exchanged among said central processing unit and said storage units, wherein:

said storage subsystem is coupled to said central processing unit in accordance with I/O interface protocol by which said central processing unit issues I/O requests having a chain of plural commands and data to said storage control unit asynchronously with responses from said storage control unit;

said storage control unit comprising deciding means configured so as to decide an order of processing said plural commands and data from said

central processing unit independently of the order they were received, and executes said commands; and

said plural storage units are under control of said storage control unit.

5. A method of controlling an I/O interface that is used for connection between a central processing unit and a storage control unit placing plural storage units under control thereof in which data exchanged with said central processing unit is stored, and having a cache memory for temporarily storing the data, and has a protocol by which said central processing unit issues an I/O request consisting of a chain of plural commands and data to said storage control unit asynchronously with responses from said storage control unit, comprising steps of:

performing, for commands from the central processing unit, data transfer with said central processing unit in an order independent from the order the commands were received, and reporting command end for each of the commands in said storage control unit;

receiving data and command end reports from said storage control unit in an order independent of order of issuance of commands and data from said central processing unit, locating issued commands corresponding to said received data and command end reports, and processing said data and command end reports as a response frame for said located issued commands in said central processing unit.

6. The I/O interface control method according to claim 5, further comprises steps of:

receiving data and command end reports from said storage control unit in an order independent of order of issuance of commands and data from said central processing unit, continuing the I/O request processing without discontinuing it until receiving a command end report for all commands constituting said I/O request, and performing, after receiving said command end report for all commands constituting said I/O request, recovery processing only for commands indicated as an error or a retry request in said received command end report in said central processing unit.

7. An information processing system, comprising:

a central processing unit;

a storage control unit having plural storage units under control thereof in which data exchanged with said central processing unit is stored, and having a cache memory for temporarily storing the data; and

an I/O interface that is used for connection between said central processing unit and said storage control unit and has a protocol by which said central processing unit issues an I/O request consisting of a chain of plural commands and data to said storage control unit asynchronously with responses from said storage control unit,

wherein said storage control unit has a means, for commands from said central processing unit, performs data transfer with said central processing unit in an order independent from order of said commands were received, and reports command end for each of said commands,

wherein said central processing unit has means that receives data and command end reports from said storage control unit in an order independent

of an order of issuance of commands and data from said central processing unit, locates issued commands corresponding to said received data and command end reports, and processes data and command end reports as a response frame for said located issued commands.